

Work Order ID 144466

April 19, 2016 9:19:51 AM

144466

Page 1

Item ID: D350-748-203 Accept *N900040100* Setup Start *NS1*

Revision ID: Stop *NS2*

Item Name: AS350 / AS355 Stainless Steel Aft Crosstube

Start Date: 4/19/2016 Start Qty: 1.00 *1*

Required Date: 5/6/2016 Req'd Qty: 1.00 *1*

Reference: Cust Item ID: Customer:

Approvals: Process Plan: SA Date: 20160419 Tooling: Date: Run Start *NR1*

QC: Date: SPC (Y/N): Date: Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr								
D350-748-243	A								

100	Document Control	0.00							
100	DOCUMENT CONTROL								
DC	Memo	0.00							
Doc.Control -USB or Paperwork	Photocopy bluefile & type labels per PPPD350-748-201		CHG001						

110	BENDING MACHINE - CROSSTUBES	0.00							
110									
CNC Bend 2	Memo	0.00							
CNC Alpha 160 Bender	Bend tube as per Dwg D350-748-243 using CNC bender program D350A and Folio FT								
	*****UNDER BEND .225" PER SIDE*****								
	****USE (4) DT9824 SHIM BLOC TO CHECK STRAIGHTNESS****								

D350-748-203/144466

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width: 100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐																																																	
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Page 2

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 Revision ID: Stop *NS2*
 Item Name: AS350 / AS355 Stainless Steel Aft Crosstube
 Start Date: 4/19/2016 Start Qty: 1.00 *1* Cust Item ID:
 Required Date: 5/6/2016 Req'd Qty: 1.00 *1* Customer:
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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
127	QC15- Crosstube Dimensional Check	0.00							
127									
QC	Memo	0.00							
Quality Control	***MARK CUT LINES***								
128		0.00							
128									
Crosstubes	Memo	0.00							
Crosstubes	CUT TUBE AT HEIGHT ON FAI SHEET								
	VERF HEIGHT <u>3.35"</u> BY QC 15 LEVEL INSPECTOR								
	VERF TWIST <u>0.164"</u> BY QC15 LEVEL INSPECTOR								

DAS
03
9-89

16-4-21

BC 6/04/21

DAS
47
9-89

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

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 Revision ID: Stop ***NS2***
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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
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130		0.00							
130	Crosstubes								
Crosstubes	Memo	0.00							
Crosstubes	2- Drill Tube as per Dwg D350-748-243 Using DT8876 Drill Jigs, Set-up drill table as per QSI 010								
	3 -Deburr								
	4- Engrave Part # and Batch # as per Dwg D350-748-243								
	5-Remove all marks from tube within limits of D350-748-243								
140	QC5- Inspect part completeness to step on W/O	0.00							
140									
QC	Memo	0.00							
Quality Control									

DAS
38
9-89
MAY 06 2016

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

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174	Outsource process - NDT per QSI038 4.1	0.00							
174									
Outsource2	Memo	0.00							
Outsource process - NDT	ISSUE P/O TO ACCUREN: <u>32321</u>								
176	Receive & Inspect for Damage & Mat'l Certs	0.00							
176									
Packaging	Memo	0.00							
Packaging									
178	QC5- Inspect part completeness to step on W/O	0.00							
178									
QC	Memo	0.00							
Quality Control									

1 MAY 12 2016 DAS 13 9-89

1 MAY 12 2016 DAS 13 9-89

16-07-06 DAS 9 9-89

DQA: _____ Date: _____



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Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval																		
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Work Order ID 144466

April 19, 2016 9:19:51 AM

144466

Page 5

Item ID: D350-748-203 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: AS350 / AS355 Stainless Steel Aft Crosstube
 Start Date: 4/19/2016 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 5/6/2016 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180	SprayPaint	0.00							DAS 41 9-89
180		0.00							
SprayPaint	Memo								
Spray Painting	***VERIFY BY <u>DAS</u> BATCH # TO MATCH W/O								16-5-20
	***VERIFY BY <u>41</u> PART # TO MATCH								
	W/O _____								
	MASK SCRIBE B# & P# AND VERIFY								
	1. Apply Axalta 13205S Cleaner inside and outside crosstube per QSI 005 4.1.4								
	BATCH: <u>132520</u>								
	2. Axalta 230S Metalok inside and outside crosstube per QSI 005 4.1.4								
	BATCH: <u>132474</u>								
	3. Prime inside and outside crosstube per QSI 005 4.2								
	BATCH: <u>134454</u>								
	4. Paint outside of crosstube per QSI 005 4.2								
	BATCH: <u>134585</u>								

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
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Date :		Step #:		QTY Effective :			MRB (QSI042) Approval																		
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OTHER :																									

Work Order ID 144466

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144466

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Item ID: D350-748-203

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: AS350 / AS355 Stainless Steel Aft Crosstube

Stop ***NS2***Start Date: 4/19/2016 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 5/6/2016 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

190

QC14- Inspect Spray Paint

0.00

190

QC

Memo

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

VERIFY BY DAS BATCH # TO MATCH W/OVERIFY BY 9 PART # TO MATCH
W/O 9-89① 16-07-06

DAS

9

9-89

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
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Date :		Step #:		QTY Effective :			MRB (QS1042) Approval																		
Description Work Order Deviation				Disposition			Completed By																		
							Lead hand / Supervisor Approval Verification																		
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Root Cause		FAULT CATEGORY																							
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Accept

N900040100

Setup Start *NS1*

Revision ID:

Item Name: AS350 / AS355 Stainless Steel Aft Crosstube

Stop *NS2*

Start Date: 4/19/2016 **Start Qty:** 1.00 ***1***

Cust Item ID:

Required Date: 5/6/2016 **Req'd Qty:** 1.00 ***1***

Customer:

Reference:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/
Work Center ID

Operation Description

Set Up/ Run Hours

Tool ID	Tool #	Plan Code
---------	--------	-----------

**Accept
Qty**

Reject
Qty

Reject Number

Insp. Stamp

200

0.00

200

Crosstubes

0.00

Crosstubes

Memo

Crosstubes

INSTALL GROUND WIRE INSERT, THEN INSERT SCREW AND WASHER

*****LIMIT AIR PRESSURE TO 50 PSI WHEN INSTALLING AETC-1032
INSERT AND ONLY EXPAND INSERT ONCE*****

1-Abrade mating surfaces of support and crosstube with 180 grit sandpaper, clean the area with MEK or equivalent as per dwg

2-Install supports with Proseal 890 per D350-748-243 and QSI 015

A/R Proseal 890 Batch: 134500
EXP: 11/16

3-Install supports clamps Using Dt8876 as per Dwg D350-748-243,Torque to 60-80 IN-LBS.

PROSEAL CURE TIME 72 HOURS:

Start: 16-5-24

Finish: 16-5-27

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width: 100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
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Work Order ID 144466

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Page 8

Item ID: D350-748-203 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: AS350 / AS355 Stainless Steel Aft Crosstube
 Start Date: 4/19/2016 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 5/6/2016 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210	QC5- Inspect part completeness to step on W/O	0.00							
210									
QC	Memo	0.00							
Quality Control	***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED FOR 72HOURS AS PER DWG.***								
	***VERIFY BY <u>PD</u> BATCH # TO MATCH W/O								
	***VERIFY BY <u>PD</u> PART # TO MATCH W/O								
220	Pick Kit	0.00							
220									
Packaging	Memo	0.00							
Packaging									

DAS 6 9-89
 JUL 06 2016
 DAS 28 9-89

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width: 100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
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OTHER :																									

Work Order ID 144466

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Item ID: D350-748-203

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: AS350 / AS355 Stainless Steel Aft Crosstube

Stop ***NS2***Start Date: 4/19/2016 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 5/6/2016 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
230	QC4- 100% Inspect kits for completeness	0.00							
230									
QC	Memo	DAS 0.00				DAS 27 9-89			
Quality Control	***VERIFY BY <u>144466</u> 0-89 BATCH # TO MATCH W/O					JUL 06 2016			
	***VERIFY BY <u>144466</u> 27 PART # TO MATCH W/O								
		9-89							
240		0.00							
240	Packaging					/	DAS 27 9-89	DAS 28 9-89	JUL 07 2016
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPPD350-748-203								
	Location: <u>1935</u>								
	PPP Rev: _____								
250	QC21- Final Inspection - Work Order Release	0.00							
250							DAS 21 9-89		JUL 08 2016
QC	Memo	0.00							
Quality Control									
							DAS 21 9-89		JUL 08 2016

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					

Root Cause			FAULT CATEGORY					
Environment ☐	☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐		
Design ☐		Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐		
Doc/Data ☐		Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐		
Equip/Tooling ☐		Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐		
Handling/Pre ☐		Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐		
Material ☐		Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐		
Internal Transport ☐		Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐		
Tribal Knowledge ☐		Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐		
LOA ☐		Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐		
Substation ☐		Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐		
Past Expiry Date ☐		Manufacturing Process ☐	OTHER : _____					
Misidentified ☐		Past Due ☐						

Picklist Print

April 19, 2016 9:19:58 AM

Page 1

Work Order ID: 144466

144466

Parent Item: D350-748-203

D350-748-203

Parent Item Name: AS350 / AS355 Stainless Steel Aft Crosstube

Start Date: 4/19/2016

Required Date: 5/6/2016

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP REV:A 15.03.23 NEW ISSUE DD VERF;JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D350-748-243TRN

Manufactured

No

Each

4.0000

1

D350-748-243TRN

Crosstube Installation, High Aft

**

1 BL 16/04/19

Location

Loc Qty

Loc Code

LG003

4

143641

1

143642

1

143643

1

143644

1

D3502-1

Manufactured

No

Each

14.0000

2

D3502-1

Support

**

DAS
41
9-89

16-6-20

Location

Loc Qty

Loc Code

LG052

14

139015

14

Each

58.0000

2

D5123-7

Manufactured

No

D5123-7

Clamp Cushion

**

DAS
41
9-89

16-6-20

Location

Loc Qty

Loc Code

LG052

22

136671

2

137766

20

LG054

36

139042

36

Picklist Print

April 19, 2016 9:19:58 AM

Work Order ID: 144466

144466

Parent Item: D350-748-203

D350-748-203

Parent Item Name: AS350 / AS355 Stainless Steel Aft Crosstube

Start Date: 4/19/2016

Required Date: 5/6/2016

Start Qty: 1.00

Required Qty: 1.00

AETC-1032

Purchased

No

Each

30.0000

1

DAS

AETC-1032

41

9-89

16-5-24

Insert

Location

Loc Qty

Loc Code

LG050

28

m133732

28

ST547

2

m133002

2

NAS1149C0363R

Purchased

No

Each

714.0000

1

DAS

NAS1149C0363R

41

9-89

16-5-24

Washer

Location

Loc Qty

Loc Code

FP001

301

114742

6

m133077

295

GA

410

m133077

410

ST266

3

m133077

3

MS21920-20

Purchased

No

Each

112.0000

2

DAS

MS21920-20

41

9-89

16-5-22

Clamp

Location

Loc Qty

Loc Code

FG

2

122254

2

LG050

58

m133483

10

m133932

48

LG056

52

m128650

1

m132675

1

m134055

50

Picklist Print

April 19, 2016 9:19:58 AM

Work Order ID: 144466

144466

Parent Item: D350-748-203

D350-748-203

Parent Item Name: AS350 / AS355 Stainless Steel Aft Crosstube

Start Date: 4/19/2016

Required Date: 5/6/2016

Start Qty: 1.00

Required Qty: 1.00

MS51958-63

Purchased

No

Each

7.0000

1

DAS

MS51958-63

**

41

9-89

16-5-24

Screw

Location

Loc Qty

Loc Code

ST267

7

m131886

7

NAS1149D0563J

Purchased

No

220

Each

1,511.000

**

68-8

DAS

9

28

9-89

NAS1149D0563.J

Washer

Location

Loc Qty

Loc Code

GA

281

m125807

2

m133769

279

ST260a

1000

m134497

1000

ST263

131

m134257

131

ST269

99

m128257

99

DAS

27

9-89

MAY 30 2016

Picklist Print

April 19, 2016 9:19:59 AM

Work Order ID: 144466

144466

Parent Item: D350-748-203

D350-748-203

Parent Item Name: AS350 / AS355 Stainless Steel Aft Crosstube

Start Date: 4/19/2016

Required Date: 5/6/2016

Start Qty: 1.00

Required Qty: 1.00

MS21042L4

Purchased

No

220

Each

2,308.000

24

24

MS21042I 4

Locknut

**

134676

DAS 6 28 9-89

DAS 27 9-89

Location

Loc Qty

Loc Code

GA

324

m133769

324

OVER007

1500

m134509

500

m134606

1000

ST303

387

m134055

1

m134502

386

ST305

97

m130922

97

MS21042L5

Purchased

No

220

Each

512.0000

4

4

MS21042I 5

Nut

**

134676

MAY 30 2016 DAS 6 28 9-89

DAS 27 9-89

Location

Loc Qty

Loc Code

GA

128

m127813

128

OVER007

100

m134509

100

ST303

284

m134055

34

m134567

250

Picklist Print

April 19, 2016 9:19:59 AM

Page 5

Work Order ID: 144466

144466

Parent Item: D350-748-203

D350-748-203

Parent Item Name: AS350 / AS355 Stainless Steel Aft Crosstube

Start Date: 4/19/2016

Required Date: 5/6/2016

Start Qty: 1.00

Required Qty: 1.00

AN4-41A

Purchased

No

220

Each

199.0000

8

8

AN4-41A

Bolt

**

DAS
28
6
9-89

DAS
27
9-89

Location

Loc Qty

Loc Code

over003

120

m133769

120

ST312A

8

m130716

0

m130726

8

ST342

71

m130716

4

m132189

16

m133483

51

D3501-1

Manufactured

No

220

Each

72.0000

16

16

D3501-1

Bushing

**

DAS
28
6
9-89

DAS
27
9-89

Location

Loc Qty

Loc Code

ST039

72

142478

72

MAY 30 2016

Picklist Print

April 19, 2016 9:19:59 AM

Page 6

Work Order ID: 144466

144466

Parent Item: D350-748-203

D350-748-203

Parent Item Name: AS350 / AS355 Stainless Steel Aft Crosstube

Start Date: 4/19/2016

Required Date: 5/6/2016

Start Qty: 1.00

Required Qty: 1.00

NAS1149D0463J

Purchased

No

220

Each

3,244.000

32

32

NAS1149D0463J

WASHER

**

134634

DAS

6

9-89

DAS

28

9-89

Location

Loc Qty

Loc Code

GA

419

M129390

41

M132035

21

M134508

357

ST260a

1796

M134508

600

M134573

1196

ST263

41

M134039

41

ST269

988

M132317

100

M132677

888

DAS

27

9-89

AN5-32A

Purchased

No

220

Each

181.0000

4

4

AN5-32A

Bolt

**

DAS

6

9-89

DAS

28

9-89

Location

Loc Qty

Loc Code

over004

60

m133988

60

ST336

114

m132536

2

m133323

4

m133769

108

ST337

7

m131139

7

DAS

27

9-89

D3500-1

Manufactured

No

220

Each

0.0000

4

4

D3500-1

Saddle

**

MAY 30 2016

B144786

DAS

6

9-89

DAS

28

9-89

April 19, 2016 9:19:59 AM

Shop Packet Print

Page 6

Picklist Print

Page 7

April 19, 2016 9:19:59 AM

Work Order ID: 144466

144466

Parent Item: D350-748-203

D350-748-203

Parent Item Name: AS350 / AS355 Stainless Steel Aft Crosstube

Start Date: 4/19/2016

Required Date: 5/6/2016

Start Qty: 1.00

Required Qty: 1.00

AN4-6A

Purchased

No

220

Each

502.0000

16

16

AN4-6A

BOLT

DAS
27
9-89

DAS
28
9-89

MAY 30 2016

Location

Loc Qty

Loc Code

over003

200

M134508

200

ST345

302

M130851

39

M133790

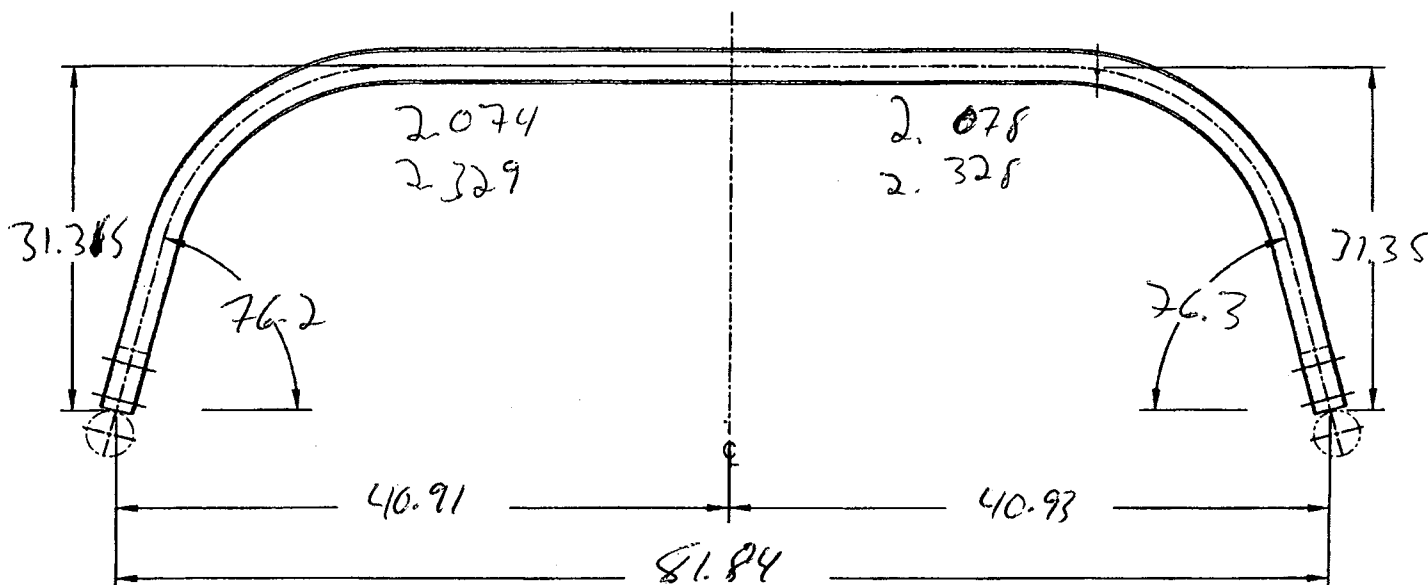
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DAS
27
9-89

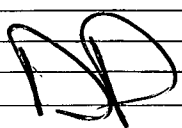
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DART AEROSPACE LTD		Work Order:	144466
Description: Crosstube High Aft, SS (AS350/355)		Part Number:	D350-748-203
Inspection Dwg: D350-748-243 Rev: A		Page 1 of 1	

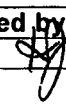
Required Dimension	Min	Max
Height	31.10	31.60
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06
Bending Passes	7	--
Crushing	--	8%
Twist	--	0.38



	Side A	Side B
Bending Passes	30	33
Crushing	6.3%	5.8%
Comments		

QC15 Inspection	
Date	

16-4-21

Rev	Date	Change	Revised by	Approved
A	15.09.09	New Issue	KJ	

Item	Qty -243	Part Number	Description
1	X	D350-748-243	CROSSTUBE ASSEMBLY (AS 350/355 HI AFT)
2	1	D6021-125	CROSSTUBE
3	2	D3502-1	SUPPORT
4	2	D5123-7	CLAMP CUSHION
5	1	AETC-1032	INSERT
6	2	MS21920-20 OR MS21920-21/-22	CLAMP (PER DART SPEC. M-MS21920-20/-21/-22)
7	1	NAS1149C0363R	WASHER (OR AN960C10)
8	1	NAS1635-3-8	SCREW (OR MS51958-63)
9	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6021-125
FINISHED LENGTH AFTER TURNING = 124.70±0.08 (AFTER BENDING/TRIMMING = 122.70 REF)
- 2) FINISH: PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCE: PER DART QSI 018 UNLESS OTHERWISE NOTED.
WALL THICKNESS ECCENTRICITY PER DART QSI 038 7.2
MIN. ALLOWABLE WALL IS -0.020 FROM NOMINAL
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: DART PART NUMBER "D350-748-243" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 29.85 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.290 HOLE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.

TURNING

- 10) BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.

BENDING

- 11) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES PER SIDE. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 8% BASED ON O.D. ON TOP HALF OF BEND, AND 8% ON BOTTOM HALF OF BEND.
- 12) MAX AMPLITUDE OF RIBBLING ALONG BENT PORTION OF THE TUBE IS 0.030 (ZN A1-3)
- 13) MAX TWIST: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.38 (ZN C1-3).

ASSEMBLY

- 14) TO INSTALL D3502-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.02" TO 0.05" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 60 TO 80 IN.-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

DEO ATTACHED

RELEASED

2015 MAR 18

20160419

SH 144466

RELEASED

2015 MAR 18

UNDER REVIEW

15/4/16
LRF 15/5/16

A	NEW ISSUE	CP	15.01.21
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED	A.P.		
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	15.01.21		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D350-748-243	REV. A SHEET 1 OF 4
TITLE CROSSTUBE (AS 350/355 HI AFT)	SCALE NTS

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8 7 6 5 4 3 2 1

D

D

C

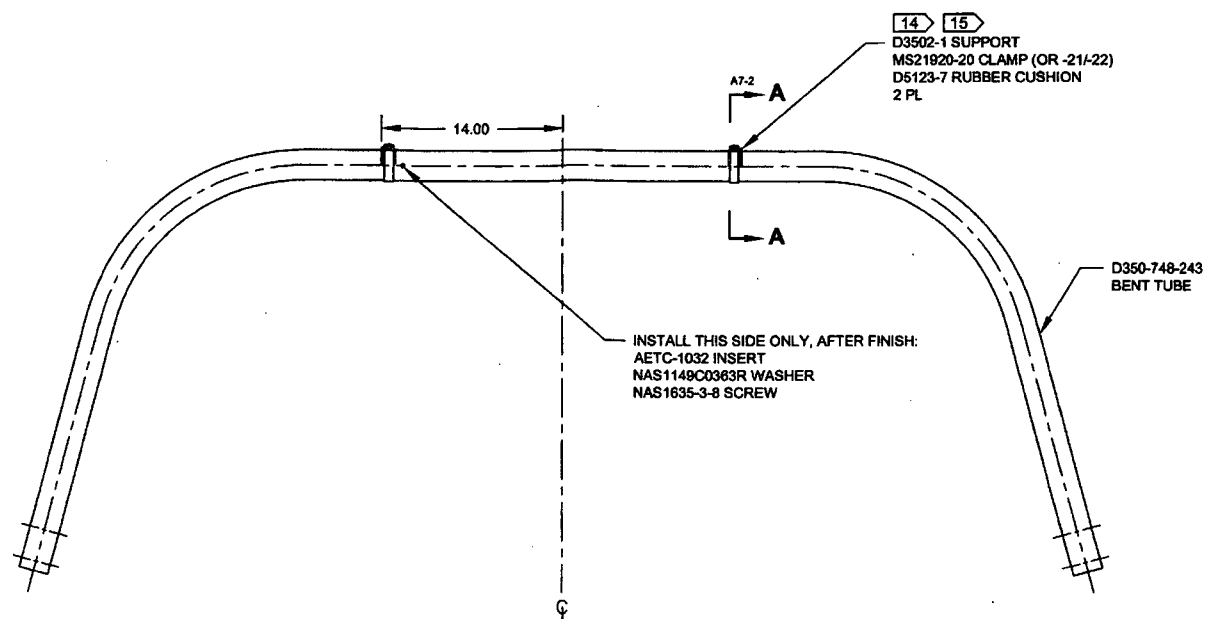
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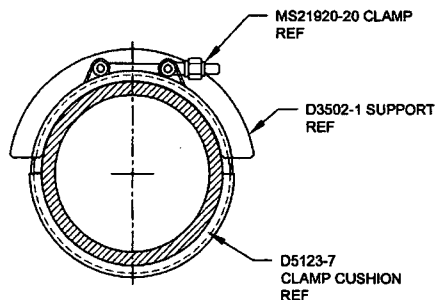
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A

A



**D350-748-243
ASSEMBLY DETAIL**



SECTION A-A D4-2
SCALE 6X

DEO ATTACHED

UNDER REVIEW

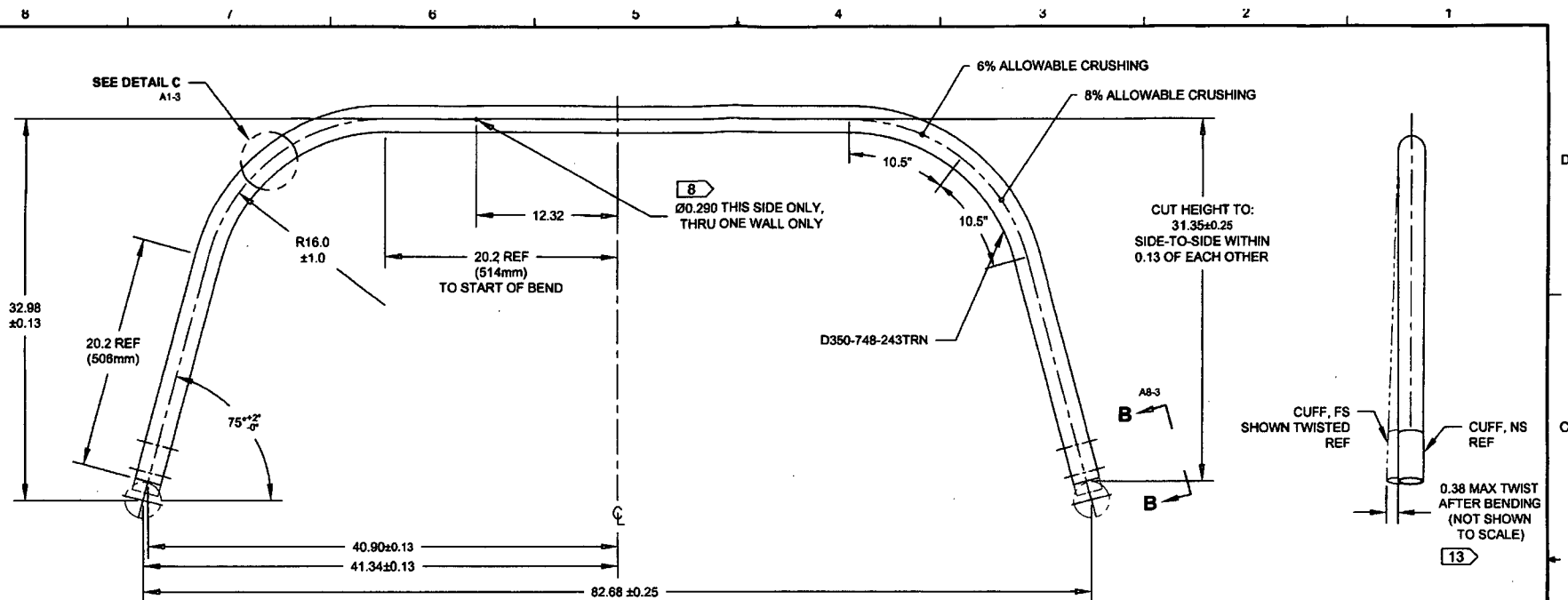
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OK 15/1/22
9/16/29

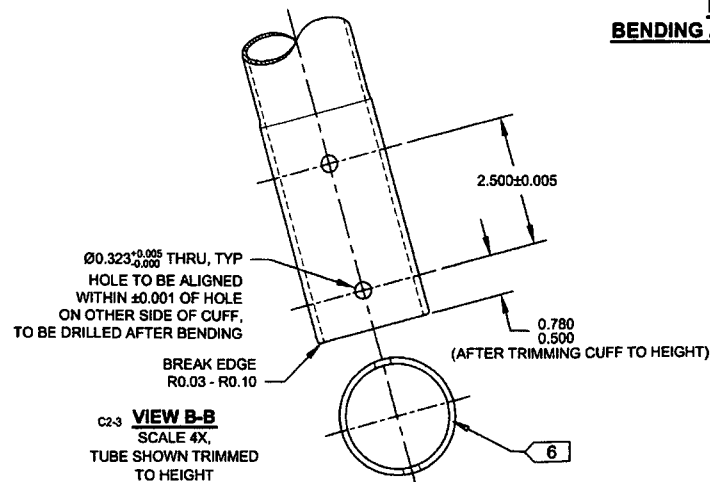
2015 MAR 18

DESIGN	90	DART AEROSPACE LTD	
DRAWN	90	HAWKESBURY, ONTARIO, CANADA	
CHECKED	A.P.	DRAWING NO.	REV. A
MFG. APPR.	2/11	D350-748-243	SHEET 2 OF 4
APPROVED	2/11	TITLE	SCALE
DE APPR.	2/11	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	15.01.21	COPYRIGHT © 2015 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD	

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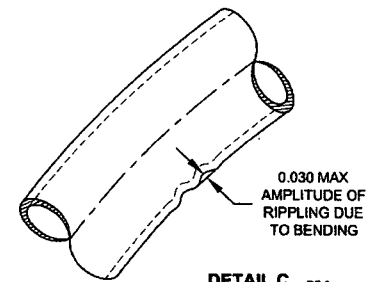


D350-748-243
BENDING AND DRILLING DETAIL 11



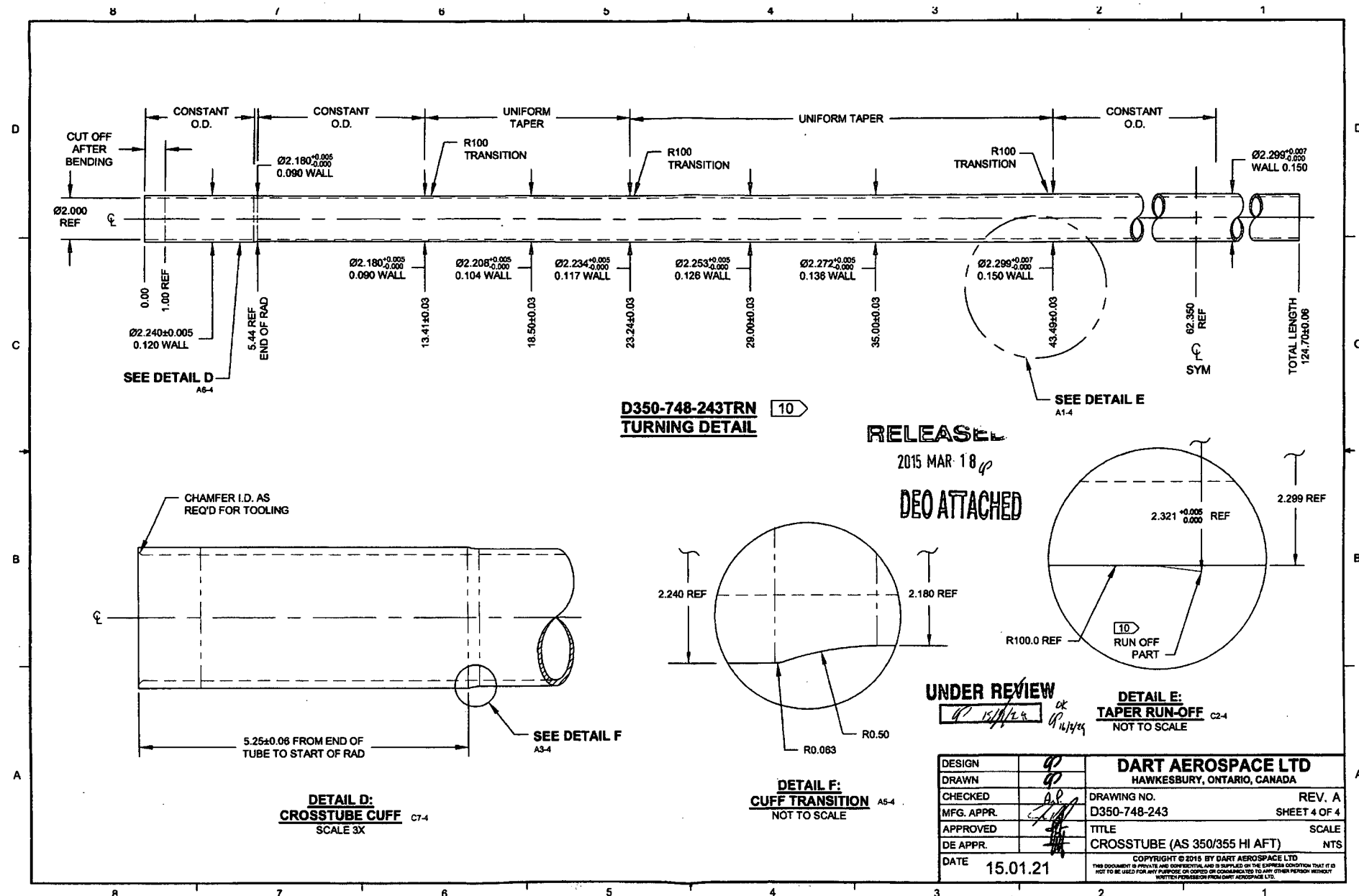
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RELEASED
2015 MAR 18 up

UNDER REVIEW
15/11/15 OK 9/6/15



DETAIL C D7-3
SCALE 4X
RIPPING EXAGGERATED

DESIGN	90	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	90	DRAWING NO.	REV. A
CHECKED	A.P.	D350-748-243	SHEET 3 OF 4
MFG. APPR.	90	TITLE	SCALE
APPROVED	90	CROSSTUBE (AS 350/355 HI AFT)	NTS
DE APPR.	90	COPYRIGHT © 2015 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	
DATE	15.01.21		



DRAWING NO. D350-748-243	TITLE CROSSTUBE	REV. A	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D350-748-243-A-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>q</i>	CHECKED <i>ASS</i>	MFG. APPR. <i>[Signature]</i>	APPROVED <i>[Signature]</i>		DE APPR. <i>[Signature]</i>		
DATE 15.11.18	DATE 15.11.18	DATE 16.02.19	DATE FEB 19 2016		DATE 2016.02.19		

AMEND NOTE 2 (SHEET 1) AS FOLLOWS:

- 2) FINISH: PREPARE SURFACE PER DART QSI 005 4.1.4
 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
 PAINT OUTSIDE PER DART QSI 005 4.2
 OR
 POWDER COAT WHITE (4.3.5.2) PER DART QSI 005 4.3

RELEASED
 2016-02-26
 EN 16-534 *[Signature]*

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Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO32321**

Purchase Order Date 5/10/2016

PO Print Date 5/12/2016

Page Number 3 of 5

Order From :
SKYSERVICE
6120 MIDFIELD ROAD
MISSISSAUGA, ONTARIO L5P 1B1
CANADA

VC-SKY001

Ship To : DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name
Vendor Phone 905-678-5636

Ship To Contact
Ship To Phone

Ship Via: Delivered
Ship Acct:

Buyer Chantal Lavoie
Customer POID
Customer Tax # 10127-2607
Terms Net 30
Currency CAD
FOB FCA - (Free Carrier)

Line Total: \$0.00

6	144406	D350-748-103 CROSSTUBE	5/12/2016	1.00	\$0.00	\$0.00
---	--------	---------------------------	-----------	------	--------	--------

Yes
5/12/2016

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: \$0.00

7	144465	D350-748-203 CROSSTUBE	5/12/2016	1.00	\$0.00	\$0.00
---	--------	---------------------------	-----------	------	--------	--------

Yes
5/12/2016

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: \$0.00

8	144466	D350-748-203 CROSSTUBE	5/12/2016	1.00	\$0.00	\$0.00
---	--------	---------------------------	-----------	------	--------	--------

Yes
5/12/2016

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

C216105112

Note:

5/12/2016

**skyservice****Work Order Traveler**
Sky Service F.B.O. Inc.

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO28223	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: 32321
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

Work Required:

CARRY OUT NDT ON 8 CROSSTUBES, 1 FUEL TANK & 6 RAPPEL SLIDE BARS AS PER PO32321

1 FUEL TANK ASSY, ITEM ID# D4464-041, WORK ORDER ID# 144493

6 RAPPEL SLIDE BARS, ITEM ID# D3011-1, WORK ORDER ID# 144817

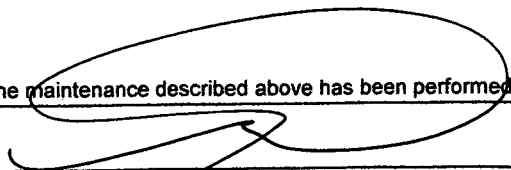
3 STAINLESS STEEL AFT CROSSTUBES, ITEM ID# D350-748-203, WORK ORDER ID# 144465, 144466, 144467

3 STAINLESS STEEL FWD CROSSTUBES, ITEM ID# D350-748-103, WORK ORDER ID# 144404, 144405, 144406

2 FWD CROSSTUBES, ITEM ID# D212-664-101, WORK ORDER ID# 145389, 145390

Action Taken:						Date:	Initial/Stamp:
LPI C/O IAW ASTM E-1417M-13 NO CRACK FOUND PEN. ZL-56, B#14M046, UV M-20141, CLEANER SKC-S #14H01K, DEV. 13M25K						MAY 11 2016	 
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature: 	ACA/SCA Stamp 	Date: MAY 11 2016
Name: RAFIK BELKHAN		

4.0 WEIGHT AND BALANCE

The following weight and balance information is for Dart crosstube installations only. This data should be similar to the existing installation. Differences from the parts removed are the responsibility of the installer.

DART CROSSTUBE	FWD/AFT	WEIGHT	STA	MOMENT
D350-748-101	Fwd	35.2 lb	106.3 in	3742 lb-in
D350-748-103		(16.0 kg)	(2.70 m)	(43.2 kg-m)
D350-748-201	Aft	34.7 lb	162.4 in	5635 lb-in
D350-748-203		(15.7 kg)	(4.12 m)	(64.7 kg-m)

5.0 PARTS LIST

Qty -101	Qty -103	Qty -201	Qty -203	Part Number	Description
X				D350-748-101	CROSSTUBE INSTALLATION, AS 350/355 HIGH FWD
	X			D350-748-103	CROSSTUBE INSTALLATION, AS 350/355 HIGH FWD (SS)
		X		D350-748-201	CROSSTUBE INSTALLATION, AS 350/355 HIGH AFT
			X	D350-748-203	CROSSTUBE INSTALLATION, AS 350/355 HIGH AFT (SS)
1				D350-748-141	CROSSTUBE ASSEMBLY, AS 350/355 HIGH FWD
	1			D350-748-143	CROSSTUBE ASSEMBLY, AS 350/355 HIGH FWD (SS)
		1		D350-748-241	CROSSTUBE ASSEMBLY, AS 350/355 HIGH AFT
			1	D350-748-243	CROSSTUBE ASSEMBLY, AS 350/355 HIGH AFT (SS)
*2	*2	*2	*2	D3502-1	SUPPORT
*2	*2	*2	*2	D5123-7	CLAMP CUSHION
*1		*1		AELS-1032-225	INSERT
	*1		*1	AETC-1032	INSERT
*2	*2	*2	*2	MS21920-20	CLAMP (OR MS21920-21/-22)
*1		*1		MS27039-1-10	SCREW
	*1		*1	NAS1685-3-8	SCREW (OR MS51958-63)
*1		*1		NAS1149D0363J	WASHER (OR AN960JD10)
	*1		*1	NAS1149C0363R	WASHER (OR AN960C10)
4	4	4	4	D3500-1	SADDLE
16	16	16	16	D3501-1	BUSHING
16	16	16	16	AN4-6A	BOLT
8	8	8	8	AN4-41A	BOLT
4	4	4	4	AN5-32A	BOLT
32	32	32	32	NAS1149D0463J	WASHER (OR AN960JD416)
8	8	8	8	NAS1149D0563J	WASHER (OR AN960JD516)
24	24	24	24	MS21042L4	NUT (OR MS21042-4)
4	4	4	4	MS21042L5	NUT (OR MS21042-5)

* REFERENCE ONLY. PARTS ARE INCLUDED IN D350-748-141/-143/-241/-243 ASSEMBLIES ABOVE